Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of claims:

Claims 1-77 (Canceled)

78. (Currently amended) A method for changing the temperature of a biological matter ~~sample~~ from an initial temperature via an intermediate temperature to a final temperature, one of the initial and final temperatures being above the freezing point of said ~~sample~~ biological matter and the other being below the freezing point, comprising

providing said biological matter in the form of a sample whose ~~the~~ minimal dimension ~~of the sample~~ in each of two mutually perpendicular cross-sections ~~exceeding~~ exceeds 0.5 centimeters, and at least one of the cross-sections having an outer zone and an inner zone~~,~~ ~~the method comprising~~ such that the temperature of the sample in the outer zone changes quicker than that in the inner zone, and

changing the temperature of said sample by the following steps:

(i) changing the temperature of the sample by subjecting it to a temperature gradient from the initial temperature to the intermediate temperature until the temperature of the sample in at least one part of the outer zone equals the

intermediate temperature whilst the temperature of the sample in the inner zone ~~or in another part of the outer zone,~~ is different from said intermediate temperature;

(ii) further changing the temperature of said sample by subjecting it to the intermediate temperature until the temperature of said sample in at least one cross-section is uniform and equals the intermediate temperature; and

(iii) changing the temperature of said sample until the majority of said sample is at the final temperature.

79 – 97. (Canceled)

98. (Previously presented) The method of Claim 78, wherein said sample is subjected in step (ii) to said intermediate temperature until the temperature of the sample equals said intermediate temperature.

99. (Previously presented) The method according to Claim 78, wherein the changing of the temperature in step (i) is achieved by moving the sample through a region with a temperature gradient from the initial temperature to the intermediate temperature, and the changing of the temperature in step (iii) is achieved by moving the sample through a region with a temperature gradient from the intermediate temperature to the final temperature.

100. (Previously presented) The method of Claim 78, wherein said changing of the temperature is at least partially gradual and is achieved at least partially by the gradual movement of said sample in the direction of a temperature gradient.

101. (Previously presented) The method of Claim 100, wherein the changing of temperature in step (ii) is performed by placing said sample in a region with the intermediate temperature, said region having a length along the direction of the movement of said sample and said length is not less the length of the sample along said direction of movement.

102. (Previously presented) The method according to Claim 78, wherein the changing of the temperature in step (i) is achieved by moving the sample through a region with a temperature gradient from the initial temperature to the intermediate temperature, and the changing of the temperature in step (iii) is achieved by moving the sample through a region with a temperature gradient from the intermediate temperature to the final temperature.

103. (Previously presented) The method according to Claim 102, wherein the sample has a leading end along the direction of movement and step (i) comprises:

(a) moving the leading end of the into a region with a temperature gradient from the initial temperature to the intermediate temperature;

(b) pausing the movement until seeding takes place at the leading end; and

(c) moving the sample through said region.

104. (Previously presented) The method according to Claim 103, wherein the seeding in step (b) is achieved by introduction of liquid nitrogen to said leading end of the sample.

105. (Previously presented) The method according to Claim 101, wherein step (ii) comprises:

(a) moving the sample into the region with the intermediate temperature, until substantially the whole sample is within said region;

(b) pausing the movement of the sample within said region until the temperature of the sample is substantially uniform throughout the sample and equals the intermediate temperature; and

(c) moving the sample out of said region.

106. (Previously presented) The method according to Claim 100, wherein the velocity of movement in step (i) is equal to the velocity of movement in step (iii).

107. (Previously presented) The method according to Claim 100, wherein the velocity of movement in step (i) is different from the velocity of movement in step (iii).

108. (Previously presented) The method according to Claim 78, wherein the volume of the sample exceeds 5 milliliters.

109. (Previously presented) The method according to Claim 78, wherein the volume of the sample is 12 milliliters or more.

110. (Previously presented) The method according to Claim 78, wherein the volume of the sample is 50 milliliters or more.

111. (Previously presented) The method according to Claim 78, wherein the sample comprises blood cells.

112. (Previously presented) The method according to Claim 78, wherein the sample comprises plasma.

113. (Previously presented) The method according to any Claim 78, wherein the sample comprises one or more embryos.

114. (Previously presented) The method according to Claim 78, wherein the sample comprises semen.

115. (Previously presented) The method according to Claim 78, wherein the sample is taken from humans.

116-118. (Canceled)

119. (New) A method according to Claim 78, wherein step (ii) comprises moving the sample into a region with the intermediate temperature and subjecting the sample to the intermediate temperature in said region until the temperature of said sample in each cross-section taken perpendicularly to said direction reaches the intermediate temperature by the time it is moved out of said region.

120. (New) A method for changing the temperature of a biological matter from an initial temperature via an intermediate temperature to a final temperature, one of the initial and final temperatures being above the freezing point of said matter and the other being below the freezing point, comprising

providing said biological matter in the form of a sample whose minimal dimension in each of two mutually perpendicular cross-sections exceeds 0.5 centimeters, and at least one of the cross-sections having an outer zone and an inner zone such that the temperature of the sample in the outer zone changes quicker than that in the inner zone, and

changing the temperature of said sample by the following steps:

(i) changing the temperature of the sample by subjecting it to a temperature gradient from the initial temperature to the intermediate temperature until the temperature of the sample in at least one part of the outer zone equals the intermediate temperature whilst the temperature of the sample in the inner zone is

different from said intermediate temperature, said changing is performed by placing said sample in a region with the intermediate temperature, said region having a length along the direction of the movement of said sample and said length is not less the length of the sample along said direction of movement;

(ii) further changing the temperature of said sample by subjecting it to the intermediate temperature until the temperature of said sample in at least one cross-section is uniform and equals the intermediate temperature; and

(iii) changing the temperature of said sample until the majority of said sample is at the final temperature.

121. (New) A method for changing the temperature of a biological matter from an initial temperature via an intermediate temperature to a final temperature, one of the initial and final temperatures being above the freezing point of said matter and the other being below the freezing point, comprising

providing said biological matter in the form of a sample whose minimal dimension in each of two mutually perpendicular cross-sections exceeds 0.5 centimeters, and at least one of the cross-sections having an outer zone and an inner zone such that the temperature of the sample in the outer zone changes quicker than that in the inner zone, and

changing the temperature of said sample by the following steps:

(i) (a) changing the temperature of the sample by subjecting it to a temperature gradient from the initial temperature to the intermediate

temperature until the temperature of the sample in at least one part of the outer zone equals the intermediate temperature whilst the temperature of the sample in the inner zone is different from said intermediate temperature, said changing is achieved by moving the sample through a region with a temperature gradient from the initial temperature to the intermediate temperature, said sample has a leading end along the direction of movement;

(b) moving the leading end of the into a region with a temperature gradient from the initial temperature to the intermediate temperature;

(c) pausing the movement until seeding takes place at the leading end; and moving the sample through said region;

(ii) further changing the temperature of said sample by subjecting it to the intermediate temperature until the temperature of said sample in at least one cross-section is uniform and equals the intermediate temperature; and

(iii) changing the temperature of said sample until the majority of said sample is at the final temperature, said changing is achieved by moving the sample through a region with a temperature gradient from the intermediate temperature to the final temperature.

122. (New) A method for changing the temperature of a biological matter from an initial temperature via an intermediate temperature to a final temperature, one of the initial and final

temperatures being above the freezing point of said matter and the other being below the freezing point, comprising

providing said biological matter in the form of a sample whose minimal dimension in each of two mutually perpendicular cross-sections exceeds 0.5 centimeters, and at least one of the cross-sections having an outer zone and an inner zone such that the temperature of the sample in the outer zone changes quicker than that in the inner zone, and

changing the temperature of said sample by the following steps:

(i) changing the temperature of the sample by subjecting it to a temperature gradient from the initial temperature to the intermediate temperature until the temperature of the sample in at least one part of the outer zone equals the intermediate temperature whilst the temperature of the sample in the inner zone is different from said intermediate temperature;

(ii) (a) further changing the temperature of said sample by subjecting it to the intermediate temperature until the temperature of said sample in at least one cross-section is uniform and equals the intermediate temperature, said changing is performed by placing said sample in a region with the intermediate temperature, said region having a length along the direction of the movement of said sample and said length is not less the length of the sample along said direction of movement;

(b) moving the sample into the region with the intermediate temperature, until substantially the whole sample is within said region;

(c) pausing the movement of the sample within said region until the temperature of the sample is substantially uniform throughout the sample and equals the intermediate temperature;

(d) moving the sample out of said region; and

(iii) changing the temperature of said sample until the majority of said sample is at the final temperature.

123. (New) A method for changing the temperature of a biological matter from an initial temperature via an intermediate temperature to a final temperature, one of the initial and final temperatures being above the freezing point of said matter and the other being below the freezing point, comprising

providing said biological matter in the form of a sample whose minimal dimension in each of two mutually perpendicular cross-sections exceeds 0.5 centimeters, and at least one of the cross-sections having an outer zone and an inner zone such that the temperature of the sample in the outer zone changes quicker than that in the inner zone, and

changing the temperature of said sample by the following steps:

(i) changing the temperature of the sample by subjecting it to a temperature gradient from the initial temperature to the intermediate temperature until the temperature of the sample in at least one part of the outer zone equals the intermediate temperature whilst the temperature of the sample in the inner zone is different from said intermediate temperature;

(ii) further changing the temperature of said sample by subjecting it to the intermediate temperature until the temperature of said sample in at least one cross-section is uniform and equals the intermediate temperature, and moving the sample into a region with the intermediate temperature and subjecting the sample to the intermediate temperature in said region until the temperature of said sample in each cross-section taken perpendicularly to said direction reaches the intermediate temperature by the time it is moved out of said region; and

(iii) changing the temperature of said sample until the majority of said sample is at the final temperature.